

May 5, 1983

was described on CT as that of tissue and not fat, which one would expect with hair and sebaceous material. However, as Dr. Greene pointed out, the accuracy of CT readings is always subject to question.

The shortcomings of clinical speculation in the diagnosis of mediastinal tumors should be apparent. The emphasis must be placed on surgical intervention for both diagnosis and treatment.

W. SPENCER PAYNE, M.D.
Mayo Clinic

Rochester, MN 55905

To the Editor: "Is against this diagnosis" was an editorial change. Dr. Payne's original phrase was "detracts from this conclusion." In our opinion the revised version does not change substantially Dr. Payne's meaning, but might have conveyed that meaning more accurately if it had been worded "is somewhat against this diagnosis."

ROBERT E. SCULLY, M.D.
Massachusetts General Hospital
Boston, MA 02114

PASSIVE ABSORPTION OF NICOTINE IN AIRLINE FLIGHT ATTENDANTS

To the Editor: There is concern that nonsmokers may suffer adverse health effects from exposure to side-stream cigarette smoke (March 27, 1980, issue).¹ Airline flight attendants are regularly exposed to cabin air that is contaminated with cigarette smoke. We conducted a study to determine how much carbon monoxide and nicotine are absorbed by nonsmoking flight attendants during transoceanic commercial flights.

Participants were sought among nonsmoking flight attendants on the San Francisco-Tokyo-San Francisco route. Before the departure of the flight, blood samples were obtained from participants, and they completed questionnaires and were given containers for a urine collection during the return leg of the flight (Tokyo to San Francisco). Within one hour after their return to San Francisco, a second blood sample was obtained.

Six nonsmoking women between 30 and 40 years of age participated in the study. Only one participant lived with someone who smoked. All were full-time flight attendants who worked 68 to 73 hours per month. Five of the six attendants served in smoking sections on the Tokyo-to-San Francisco leg of the flight. The blood carboxyhemoglobin concentration (mean \pm S.D.) was 1.0 ± 0.2 per cent before takeoff, and there was no marked difference in the post-flight sample (0.7 ± 0.2 per cent). Blood nicotine concentrations, measured by gas chromatography,² increased in five of six attendants, from a mean of 1.6 ± 0.8 ng per milliliter (range, 0.8 to 2.7) to 3.2 ± 1.0 ng per milliliter (range, 1.6 to 4.5; $P < 0.05$ by Student's paired *t*-test). These concentrations are extremely low compared with concentrations (15 to 45 ng per milliliter) found in typical cigarette smokers.³ Urinary excretion of nicotine during the eight-hour flight averaged 12.9 ± 6.5 μ g (range, 6.8 to 21.7) and was lowest in the flight attendant who worked in the nonsmoking section. On the basis of urinary-excretion data and known pharmacokinetic data for nicotine,⁴ we estimated that the flight attendants, on the average, were exposed to 0.12 to 0.25 mg of nicotine, and that the flight attendant exposed to the largest amount of smoke received 0.22 to 0.43 mg during the flight. We conclude that there is passive absorption of nicotine from tobacco smoke by flight attendants during a transoceanic flight but that the quantity consumed (equivalent to one cigarette) is relatively small compared with that consumed by cigarette smokers, and the concentrations achieved are unlikely to have physiologic effects.

DONNA FOLIART, M.D.
NEAL L. BENOWITZ, M.D.
CHARLES E. BECKER, M.D.
San Francisco General Hospital
Medical Center
San Francisco, CA 94110

1. Leifant C, Liu BM. (Passive) smokers versus (voluntary) smokers. *N Engl J Med* 1980; 302:742-3.

- Jacob P III, Wilson M, Benowitz NL. Improved gas chromatographic method for the determination of nicotine and cotinine in biologic fluids. *J Chromatogr* 1981; 222:61-70.
- Russell MAH, Wilson C, Patel UA, Feyerabend C, Cole PV. Plasma nicotine levels after smoking cigarettes with high, medium, and low nicotine yields. *Br Med J* 1975; 2:414-6.
- Benowitz NL, Jacob P III, Jones RT, Rosenberg J. Interindividual variability in the metabolism and cardiovascular effects of nicotine in man. *J Pharmacol Exp Ther* 1982; 221:368-72.

COST OF SMOKING

To the Editor: Increasingly, the public and physicians are concerned about smoking as the major preventable cause of illness and death in our society. In addition, in this era of cost consciousness in medicine it is important to recognize the economics of the cigarette-smoking habit. Massachusetts had a population of 5,737,037 according to the 1980 census.¹ The American Cancer Society calculates that 25 per cent of the entire population smokes — or 1,434,259 Massachusetts citizens. The Commonwealth of Massachusetts imposes a 21-cents-per-package tax on cigarettes, and in 1980 collected \$1,444,018.195 by means of this levy,² indicating that about 685,801,000 packages of cigarettes were sold, or 1.3 packages per smoker per day, or 478 packages per year. The Office of State Health Planning estimated that in Massachusetts in 1980 total medical costs directly related to smoking were \$7,531,907,000 or \$1,313 per capita (Ghanotakis A: unpublished data). This was believed to be a conservative figure, since other estimates for 1980 were as high as \$8,500,329,000, or \$1,478 per capita.

Studies have indicated that almost 10 per cent of all medical costs are directly related to tobacco smoking.³

Luce and Schweitzer³ in 1976 estimated that the direct medical costs of smoking were 7.8 per cent of all medical costs but acknowledged that "our estimates are . . . understated." They noted a "smoking factor" of 20 per cent in all neoplasms at that time, but taking into account the continued rapid escalation of lung cancer in both men and women, currently 30 per cent of all cancer deaths in the United States are related to smoking,⁴ which is but one example of the increase in medical costs related to tobacco.

Thus, non-smoking-related per capita medical costs in 1980 are estimated at \$1,182 (90 per cent \times \$7,531,907,000 \div 5,737,037), or \$131 (10 per cent) less than the \$1,313 per capita figure for smoking-related medical costs. Annual medical costs among smokers are \$1,701 (\$1,182 + [\$753,190,700 \div 1,434,259]), or \$525 per smoker per year extra. Most striking of all is the realization that the additional \$525 in medical costs per year per smoker is the equivalent of \$1.10 per package of 20 cigarettes (\$525 \div 478 packs), or over 5 cents per cigarette!

There are a variety of suggestions on how to shift this enormous financial burden from the nonsmokers to the smokers who incur this risk, and perhaps some innovative approaches in taxation or insurance should be considered. Besides the Surgeon General's warning about health risks printed on cigarette packages, it would be informative for the smokers to recognize that other people are paying even more than the cost of the package of cigarettes to subsidize the consequences of their habit.

BLAKE CADY, M.D.
Boston, MA 02215
New England Deaconess Hospital

- 1980 United States census. Washington, D.C.: United States Bureau of the Census, 1981.
- Tobacco Excise Bureau. Cigarette Excise of Massachusetts. Massachusetts Department of Revenue, 1980.
- Luce BR, Schweitzer SO. Smoking and alcohol abuse: a comparison of their economic consequences. *N Engl J Med* 1978; 298:569-71.
- American Cancer Society. Cancer facts and figures. New York: American Cancer Society, 1982.

MORE ON BIMANUAL DEXTERITY IN BASEBALL PLAYERS

To the Editor: Although McLean and Ciurczak, the authors of the letter analyzing bimanual dexterity in major-league baseball play-